

AIRThen, AIRNow, AIRTomorrow

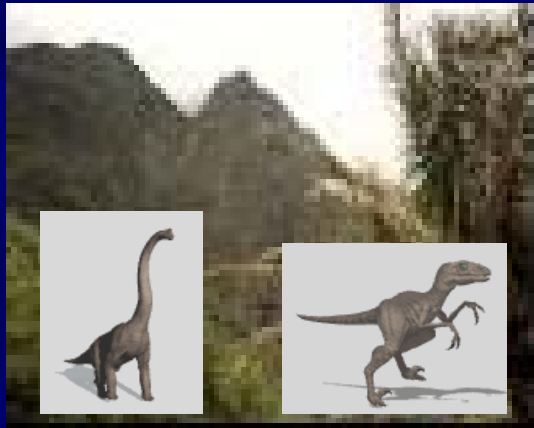
2003 National Air Quality Conference
February 3, 2003
San Antonio, TX



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Research Triangle Park, NC
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AIRThen... 135 Million Years Ago (Mesozoic Era, Jurassic Period)

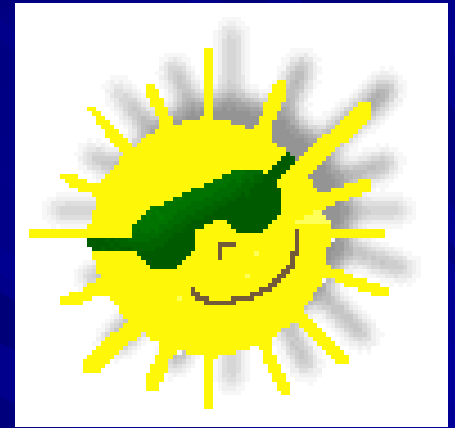
VOCs



+ NO_x



+ sunlight



= ozone

Some 134 million years later...
(Cenozoic Era, Quaternary Period)



... the first ozone map is created

1970 – The Creation of the EPA



1972 - Air Quality Trends Report...

EPA 454/R-98-016
December 1998

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA 454/R-98-016
December 1998

Air

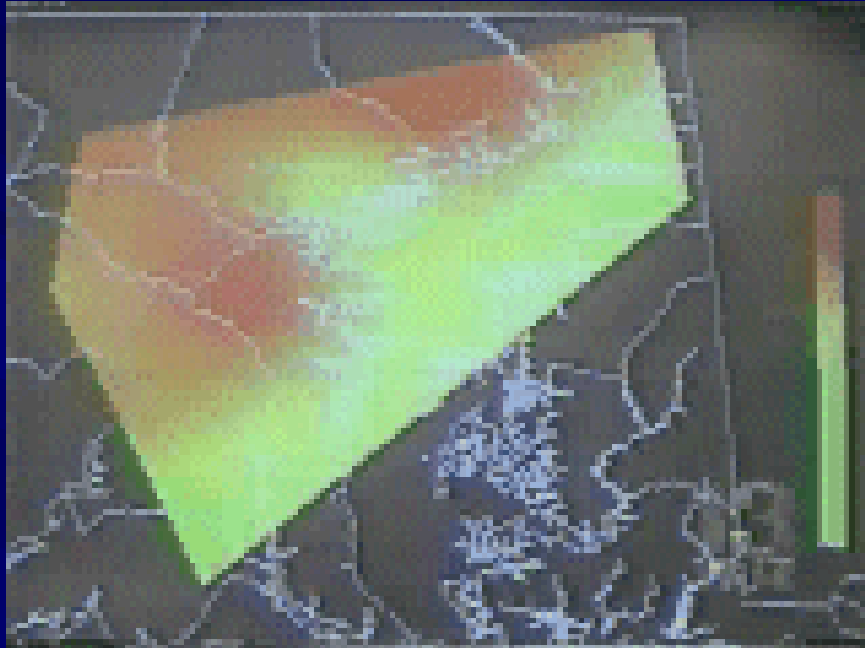


National Air Quality and Emissions Trends Report, 1997



- Annual Report on Nation's Air Quality
- Covers multiple pollutants
- Includes maps, charts, statistics
- Historical trends analyses

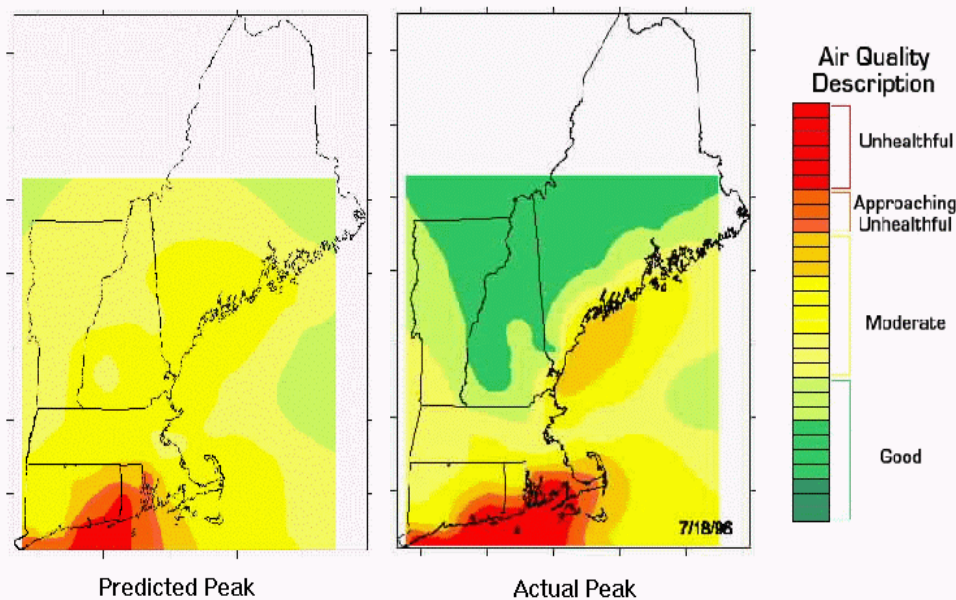
1995 – A napkin, a cocktail, an idea...



- Maryland MDE, ALA-Maryland
- 2 Cities (Baltimore, D.C.)
- 1 Map
- Updated daily



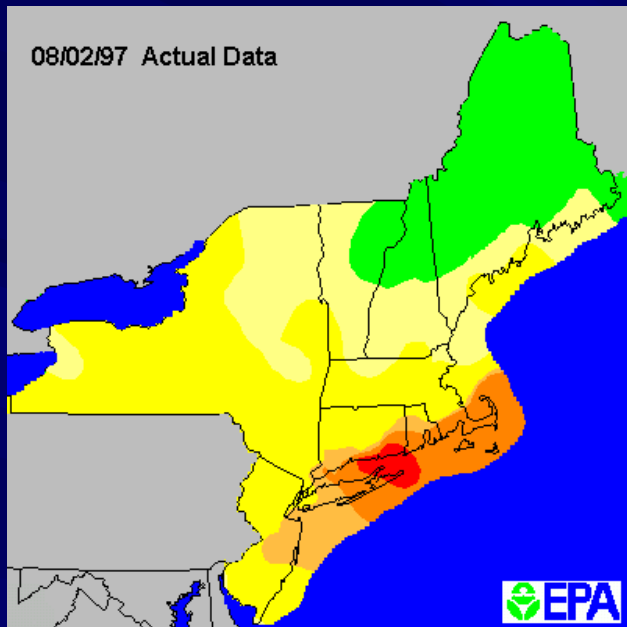
1996 – Regional Maps and Forecasts



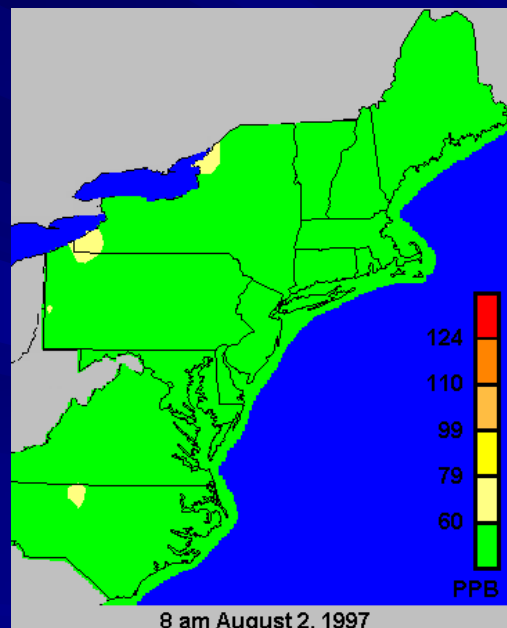
- EPA Region I & NESCAUM
- 6 New England States
- 1 Peak Map
- Based on 1-hour standard
- Updated periodically
- Regional Forecast Map

July 18, 1996

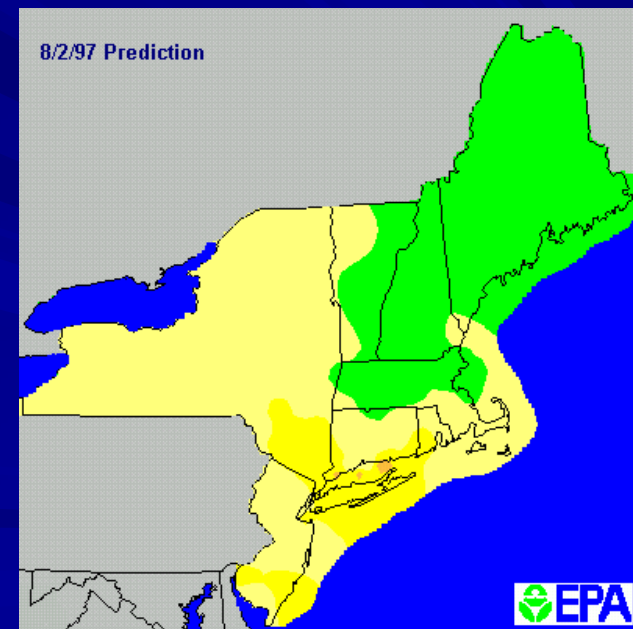
1997 – “Production”



1-hr Peak Maps



1-hr Animations



1-hr Peak Forecast Maps

1997 - The EMPACT of the AQI



- Environmental Monitoring for Public Access and Community Tracking Initiative
- Real-Time AQ Project Proposal
- ~\$5M awarded over 3 years
- “AIRNow”

- New Standards for ozone and particles
- New AQI, Health Messages
- Colors introduced... how many shades are there of yellow?

Air Quality Index Health Descriptors	Air Quality Index Values	Ozone Levels (ppm)
GOOD	0 - 50	0 - 0.064
MODERATE	51 - 100	0.065 - 0.084
UNHEALTHY FOR SENSITIVE GROUPS	101 - 150	0.085 - 0.104
UNHEALTHY	151 - 200	0.105 - 0.124
VERY UNHEALTHY	201 - 300	0.125(8-hr) - 0.404 (1-hr)

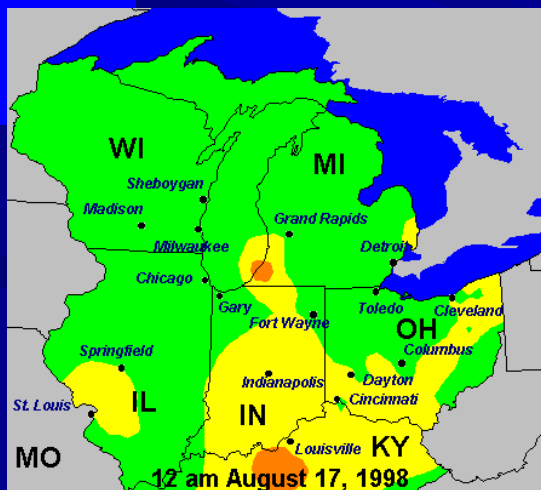
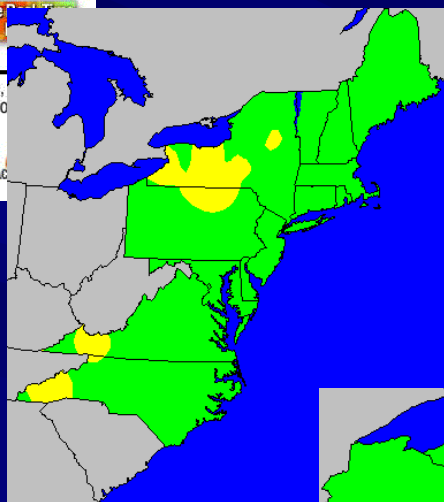
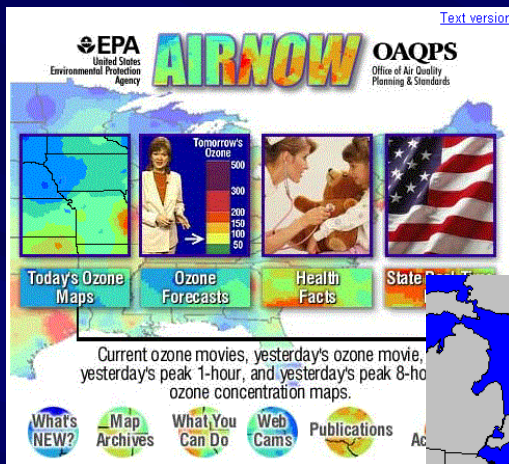
The Birth of AIRNOW

May 14, 1998

-AIRNow Website

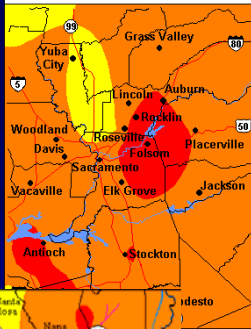
- 14 States
- 5 Domains
- Maps updated 7 times/day
- Data Collection Center (DCC) at MCNC
- Animation, 1-hr & 8-hr Peak Maps
- Forecasts for 35 Cities

- August 17, 1998
- Midwest States added
- 20 States
- 12 Domains



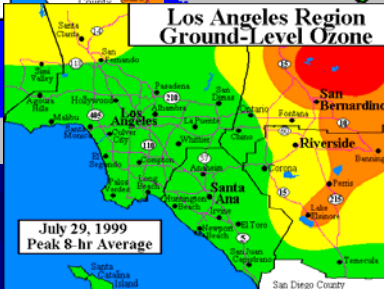
1999 - The Early Years

Sacramento Region
Ground-Level Ozone
July 11, 1999
Peak 8-hr Average

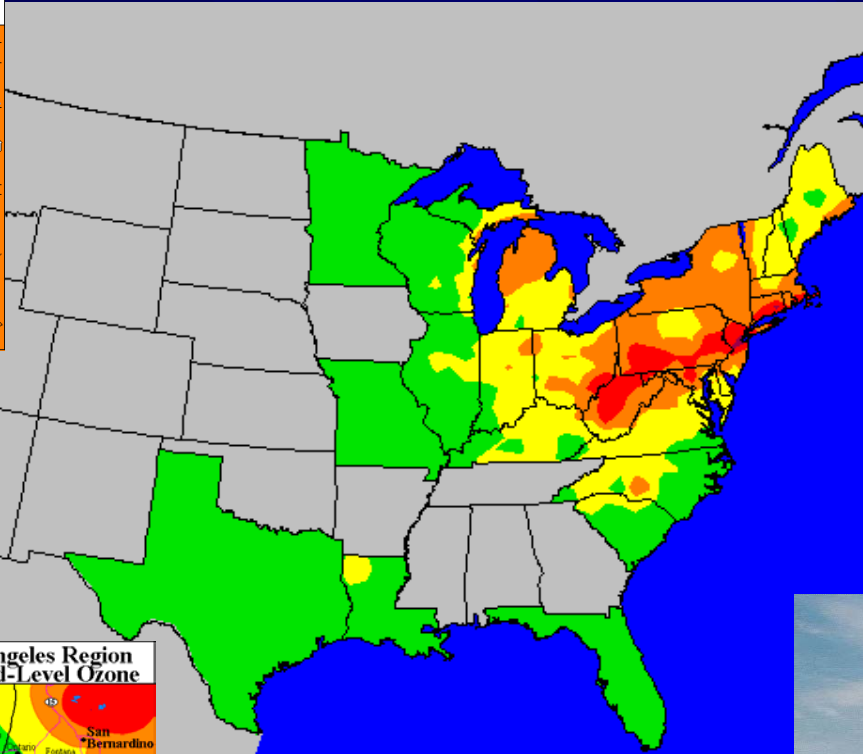


San Francisco
Bay Area
Ground-Level
Ozone
July 11, 1999
Peak 8-hr Average

Los Angeles Region
Ground-Level Ozone



July 29, 1999
Peak 8-hr Average



July 16, 1999

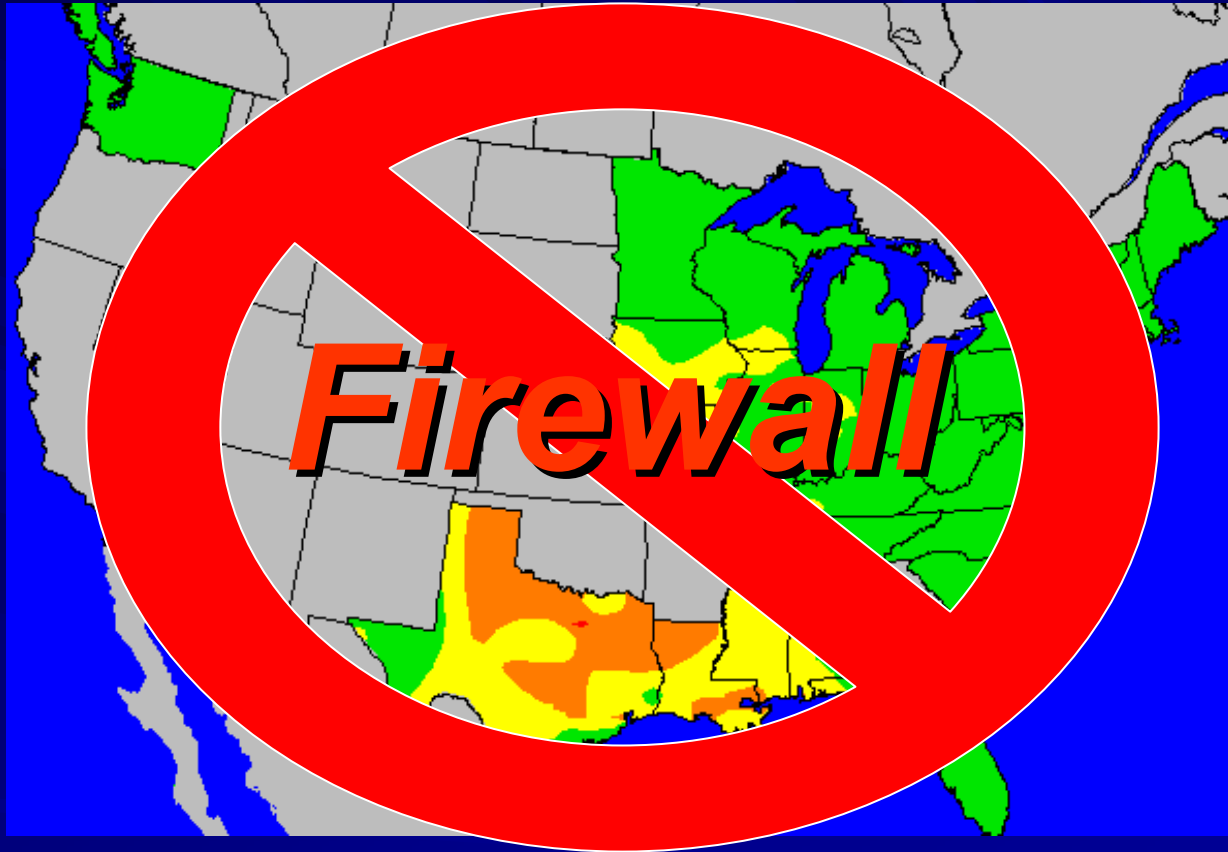
- Florida, Louisiana, Minnesota, Missouri, South Carolina, and West Virginia added
- West Coast DCC (California) added
- 27 States
- 26 Domains
- 71 Forecast Cities



-Real-time Visibility
Images (Web Cams)



2000 – Strange things happen when you're gone...

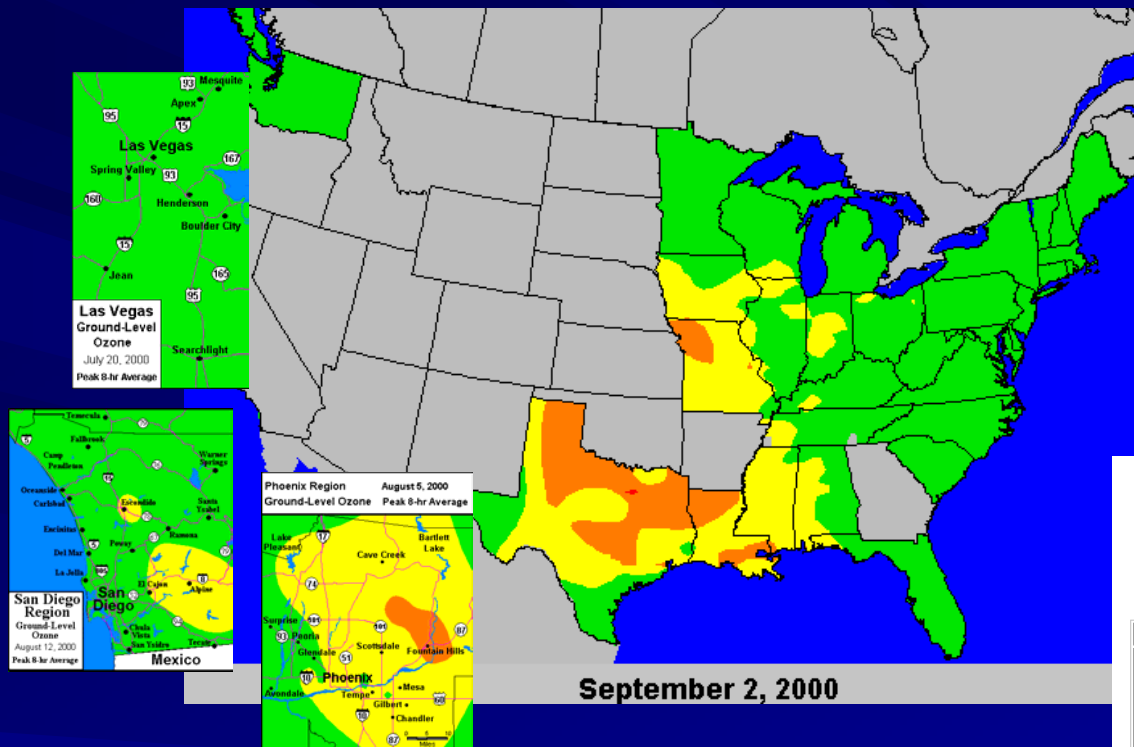


February 17, 2000... a date that will live in infamy

2000 - The Rebound Half Year

May 1, 2000

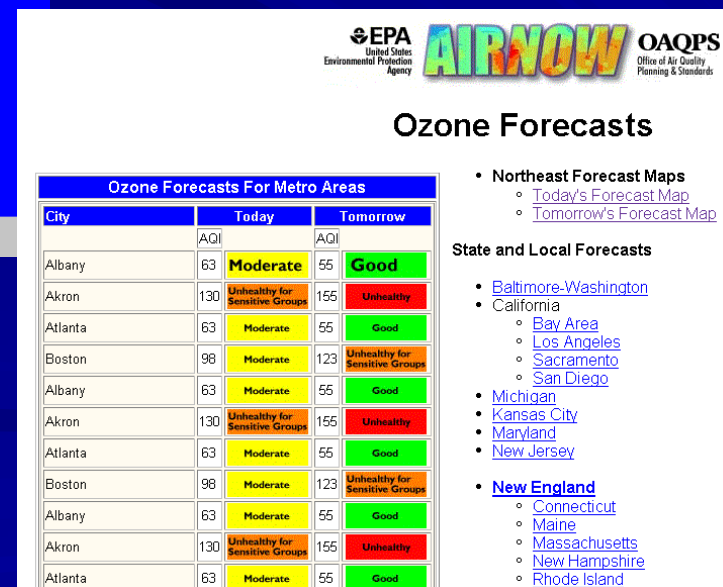
- 33 States
- 37 Domains
- 7 updates/day
- EPA & West Coast DCC's merge



September 2, 2000

-125 Forecast Cities

... and National Outreach



2000 - Media Outreach



- AQI Forecast for 36 Cities



-AQI Forecasts for 125 Cities



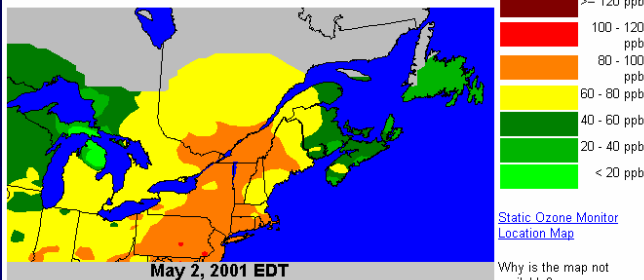
-Maps and Forecasts delivered to major WSP's



2001 – AIRNow Goes International

Ozone Peak Values

1-hour Peak Concentration Canada - Wednesday, 02 May 2001



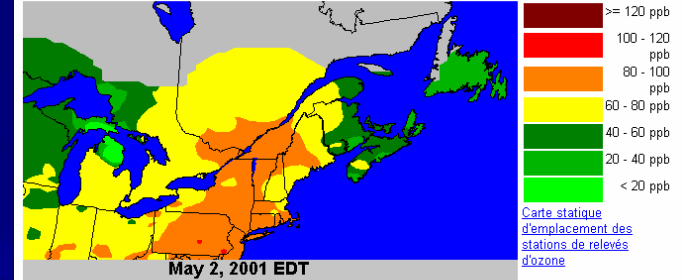
This map shows the highest ozone concentrations that were reached throughout the region during the day. It does not represent a snapshot at any particular time, but is more like the daily high temperature portion of a weather forecast. The peaks are based on one hour average concentrations in parts per billion (ppb) as shown in the legend.

This information is provided through an international co-operative effort between state, provincial, and federal governments in both the US and Canada.

[Français](#)

Concentration maximale en ozone

Concentration maximale sur une heure Canada - Mercredi, 02 mai 2001

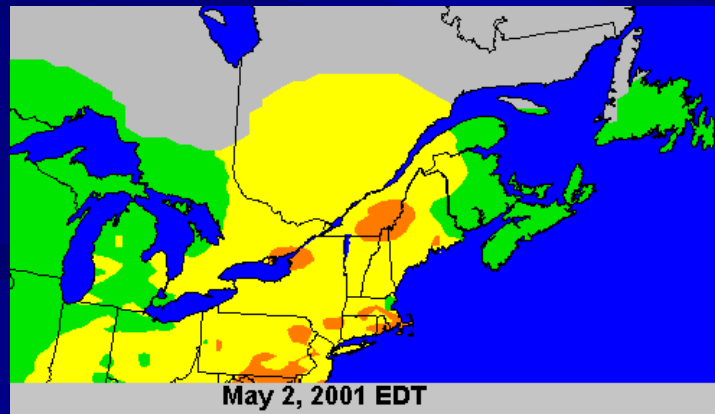


Cette carte montre les taux de concentration les plus élevés qui ont été atteints dans la région au cours de la journée. Elle ne donne pas un aperçu de la situation à un moment en particulier, mais exprime un maximum comme dans les bulletins météorologiques qui présentent les températures maximales pour une journée donnée. Les taux culminants sont basés sur la concentration moyenne mesurée sur une période d'une heure en parties par milliard (p.p. 109) (voir la légende).

Cette information est disponible grâce à une collaboration entre les gouvernements provinciaux, les États américains, le gouvernement fédéral canadien et le gouvernement des États-Unis.

[English Version](#)

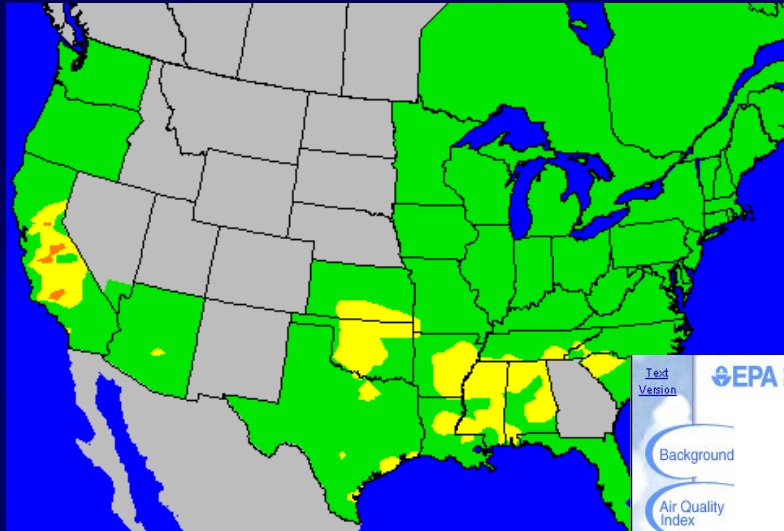
Canada 1-hr AQI - English



Canada 1-hr AQI - French

U.S. 8-hr AQI

2001 – Fill in the Blanks...



September 14, 2001

- 38 States
- 5 Provinces
- 42 Domains
- 7 Updates/day
- 165 Forecast Cities

Text Version

EPA United States Environmental Protection Agency

Office of Air Quality Planning and Standards OAQPS

Background

Air Quality Index

Health Facts

Kids

Web Cams

What's New

Action Day Programs

AIR NOW

- Where I Live
- What You Can Do
- Air Quality Forecast
- Ozone Maps
- Publications (English/Español)

EPA Home | OAR Home | OAQPS Home
<http://www.epa.gov/airnow/>

Search | Comments?
August 24, 2001

8/20/01 Cover Story

USA TODAY

08/20/2001 - Updated 09:16 AM ET



Why is the **BLANK** mirror down again!?!

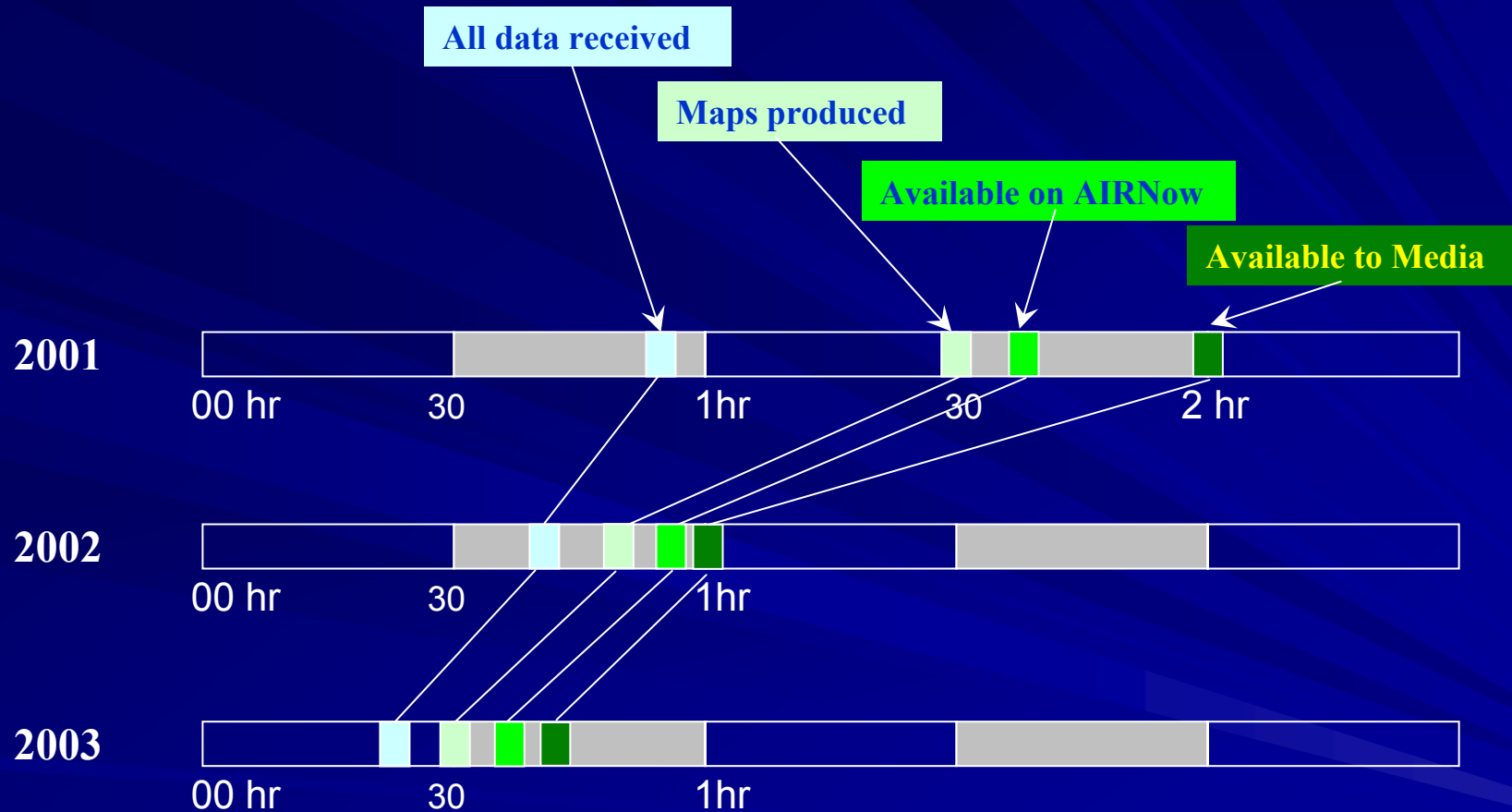
2002 – AIRNOW: A Defining Year

Metric	2001	2002
Participants	38 States 5 Canadian Provinces	44 States 6 Canadian Provinces Mexico (3 sites) National Park Service
Agencies	62	79
Monitors	~1000	~1200 – Ozone ~ 230 PM _{2.5} ~ 40 PM ₁₀
Maps	32 DCC 10 WCMC	50 for Ozone 10 for PM _{2.5}
New Maps	Canada, GSMNP, Las Vegas, SouthCentral US, Northwest, Tuscon	Colorado, Utah, New Mexico, Kansas, Oklahoma, Nevada, Louisiana, Arkansas, NPS

2002 – AIRNOW: A Defining Year

Metric	2001	2002
Forecast cities	165	273
Turn-around time	2 hours	10 to 45 minutes

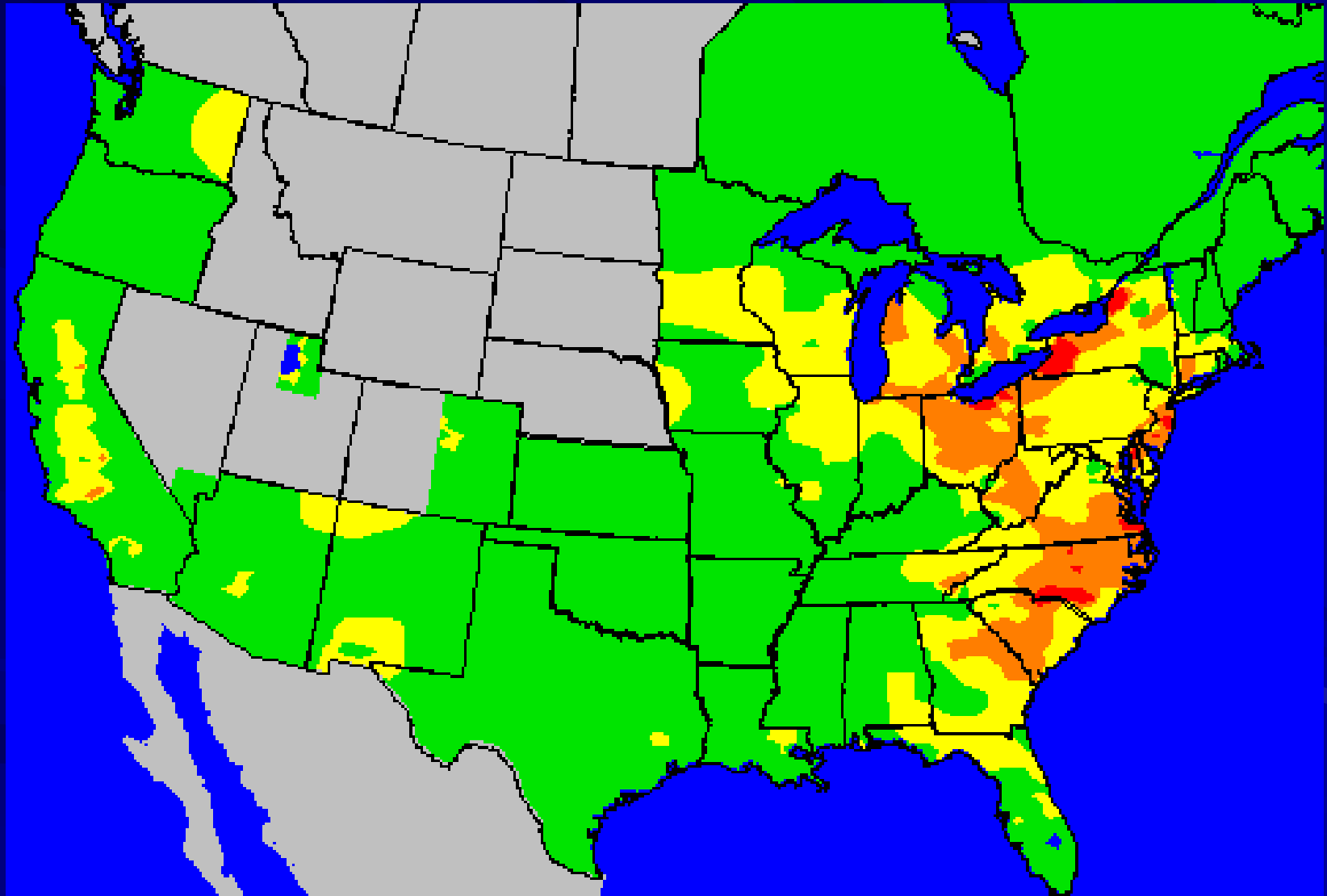
Hourly Timeline of DMC activities



2002 – AIRNOW: A Defining Year

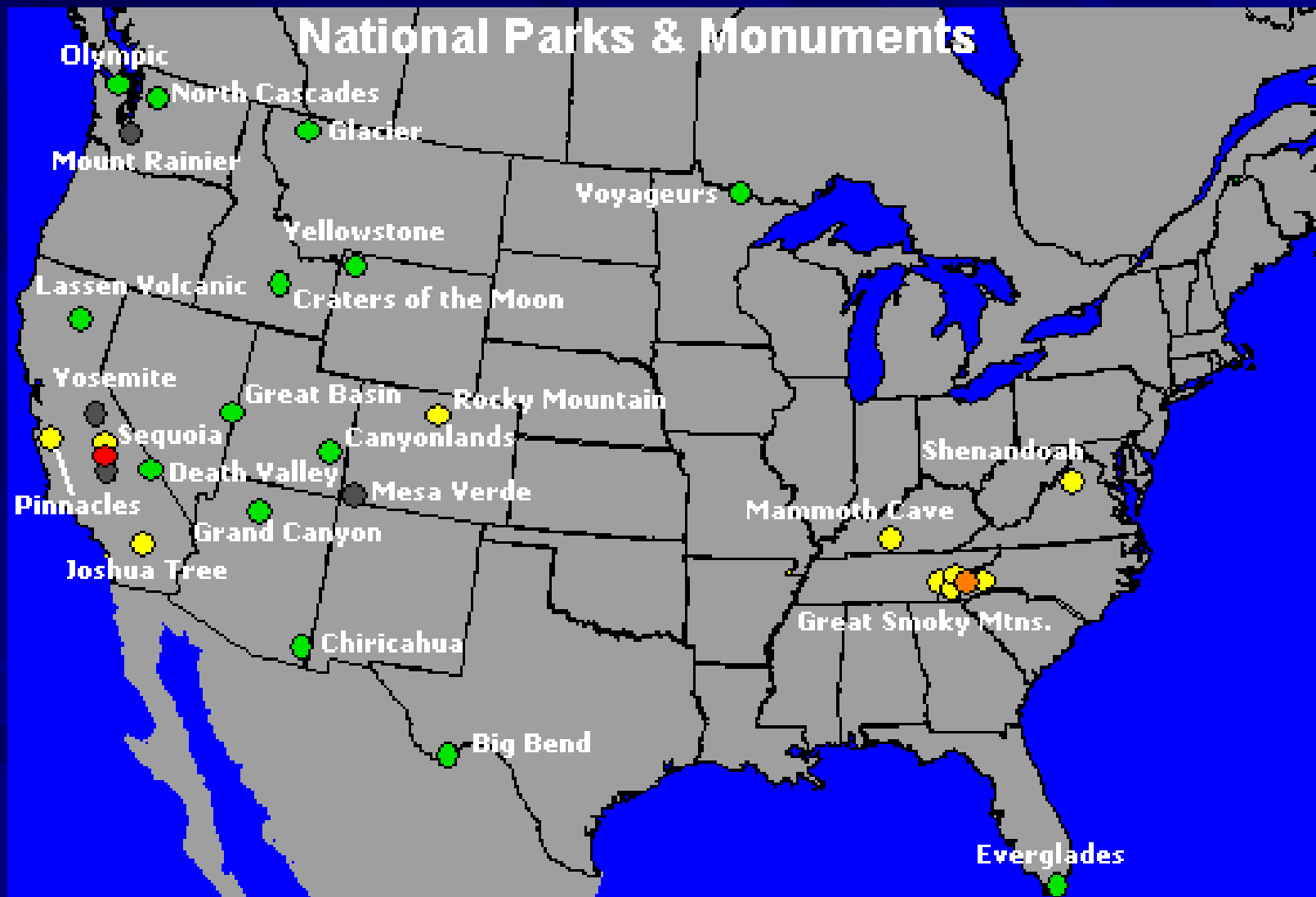
Metric	2001	2002
Forecast cities	165	273
Turn-around time	2 hours	10 to 45 minutes
Update frequency	7 times per day	Hourly (8am to 10pm) Some areas 24 hrs/day
Media/WSP partners	Weather Central, WSI, Meteorologix, USAToday, Weather.com	Weather Central, WSI, Meteorologix, AccuWeather, WeatherBank (AP), Weatherunderground.com, USAToday, Weather.com, The Weather Channel, CNN
Infrastructure	ASCII files, MapGen	Oracle Database, MapCon & MapGen
Uptime of DMC		98.8% (3628 hrs/3672 hrs)

2002 – National Maps



July 17, 2002

2002 – National Parks



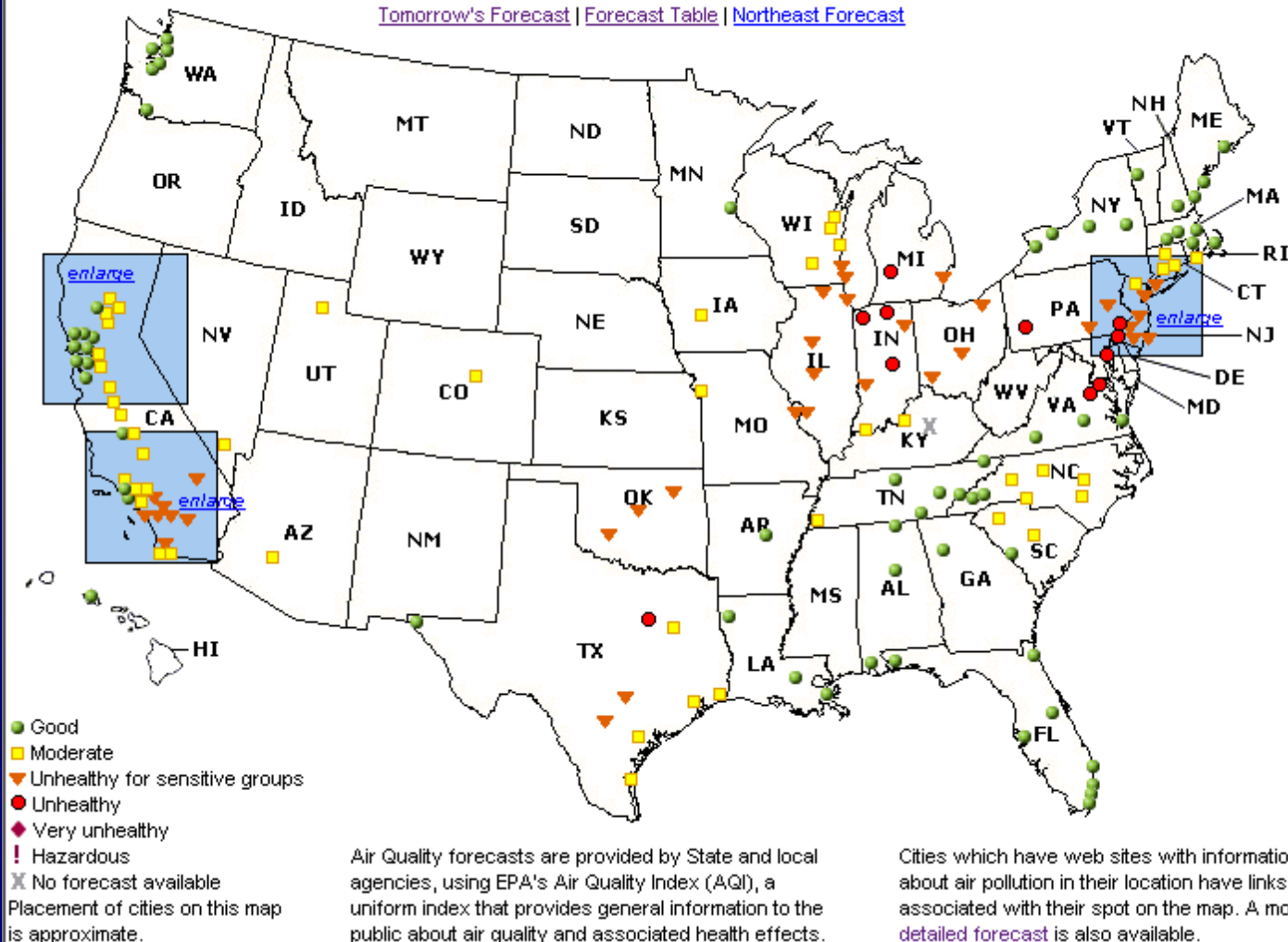
July 9, 2002

2002 – National Forecasts

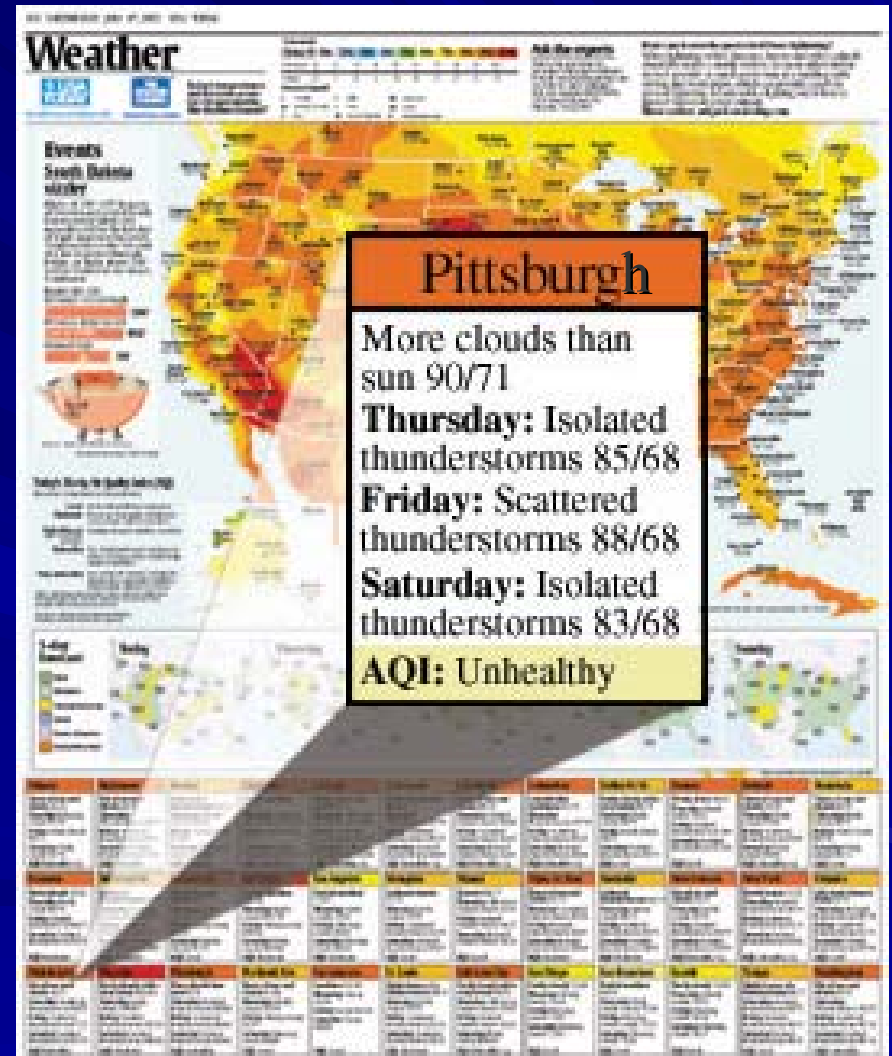
Today's Air Quality Forecast

Monday, 24 Jun 2002

[Tomorrow's Forecast](#) | [Forecast Table](#) | [Northeast Forecast](#)



2002 – National Coverage



2002 – National Awareness

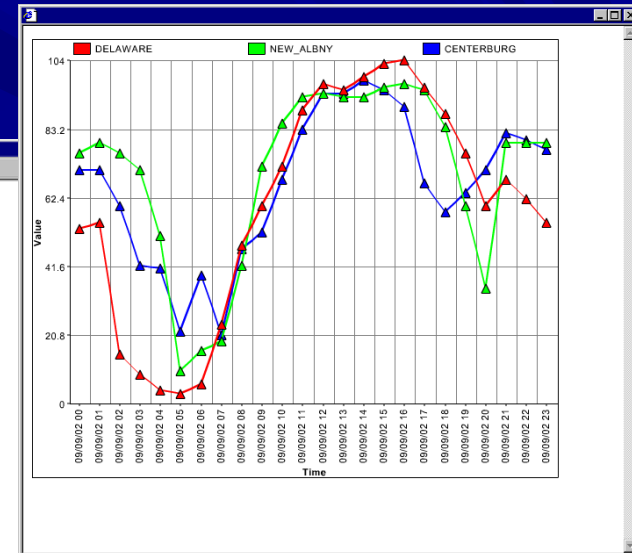
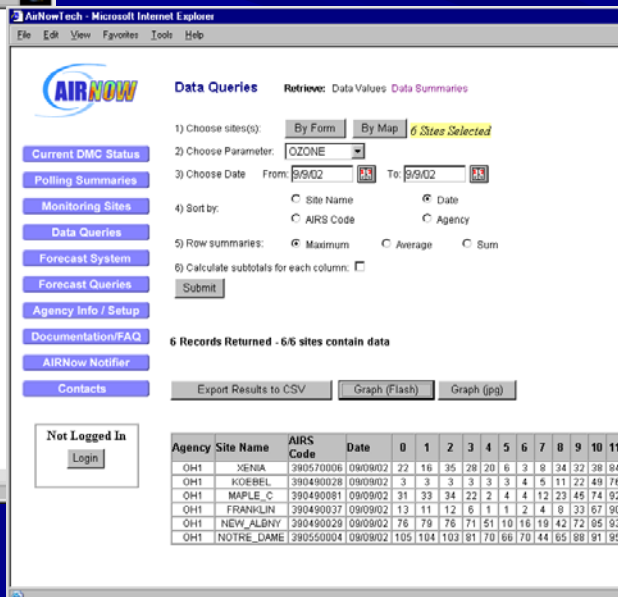
2002 Green Gauge Reports by RoperASW	“Yes” Response
Have you ever heard of ozone action days or code orange / code red air quality days?	52%
Have ozone action days or code orange / code red air quality days ever caused you to change your daily activities by reducing amount of air pollution (e.g., car pooling, driving less)?	37%
Have ozone action days or code orange / code red air quality days ever caused you to change your daily activities by reducing exposure to air pollution (e.g., modifying outdoor exercise / work habits)?	46%

2002 – Where are we?

- We have near national coverage for real-time ozone mapping
 - There are other pollutants that need to be covered
- We have 273 cities forecasting next-day ozone AQI levels
 - There are other pollutants and non-urban areas that need to be covered
- We have successful outreach to the media and public on ozone health effects
 - There are serious health effects from other pollutants
- We have extremely successful ozone “action” day programs
 - We must keep these programs strong in spite of the resource challenges related to other pollutants

2003 – AIRTomorrow AIRNow Tech

- Stakeholder access to the AIRNow database
- Data value, statistical, and polling status queries
- Time series graphs of data values and statistical query results
- Monitoring site information and QC criteria configuration
- Completion date of May 1, 2003



2003 - AIRTomorrow

- **Real-Time Reporting & Mapping of PM_{2.5}**
 - Increasing scientific evidence pointing to PM_{2.5} as a serious health concern
 - Over 230 continuous PM_{2.5} monitors reporting data to AIRNow DMC
 - Various mapping approaches being developed, analyzed and implemented
 - Air quality (esp. PM_{2.5}) is a year-round problem
 - Target: Maps for the public by October 1, 2003

2003 - AIRTomorrow

■ AQI Forecasting for PM_{2.5}

- Provides year-round coverage, health protection**
- EPA pilot effort focusing on 36 major cities across the U.S.**
- Over \$500K allocated to develop PM_{2.5} forecast tools for State and Local Agencies**
- Many Agencies already forecasting for PM_{2.5}**
- Target: PM_{2.5} forecasts for the public for all 36 cities by October 1, 2003**

2003 - AIRTomorrow

■ AQI Forecasting Model

- Provides national coverage for both urban and rural areas**
- Provides another quantitative tool for use by experienced and inexperienced forecasters**
- NOAA and EPA partnership under way to develop numerical air quality forecast model**
- Brings premier forecasting agency in the world together with EPA to provide better forecasting tool for State and Local agencies**
- Target: Testing and Evaluation to begin summer 2003**

2003 - AIRTomorrow

■ AQI Outreach for PM_{2.5}

- Provides year-round coverage of AQI**
- Provides year-round health awareness & protection**
- Provides new and useful information for State and Local agencies as well as the media**
- Enhances existing partnerships with media partners and broadcast meteorologists**
- Target: National Year-Round AQI Kick-Off in Fall 2003**

2003 - AIRTomorrow

■ Ozone Outreach Programs

- Key to success of air quality programs – Public Awareness
- Ozone is still a significant air quality concern
- Not all areas have a PM_{2.5} problem
- For those that do have both pollutants... how do we incorporate new information without degrading existing successful ozone program?
- Target: Build stronger ozone programs through collaboration with partners and other agencies... ongoing

2003 - AIRTomorrow

■ Resources

- AIRNow is a voluntary program
- Resources are limited... but
- There are opportunities
 - EPA NEIEN Grants (\$25M in FY-03)
 - New initiatives for monitoring network (?)
 - Cost savings through automation (monitor to system)
- Target: Explore use of NEIEN grant in FY-03, seek out other funding initiatives, look for automation savings, build upon success to seek funding.

AIRTomorrow

“Look at a day when you are supremely satisfied at the end. It's not a day when you lounge around doing nothing; it's when you've had everything to do, and you've done it.”

-- Margaret Thatcher

AIRTomorrow

“Someone doing it often interrupts the person saying it cannot be done.”

---Anon